



GNHWPCA

Greater New Haven Water Pollution Control Authority

260 East Street • New Haven, Connecticut 06511

Cost of Service Study for Fiscal Year 2014

April 8, 2013

Report Prepared By:



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Acronyms Used in the Report

CCF	Hundred cubic feet
CGS	Connecticut General Statutes
CWF	Clean Water Fund
FYxx	Fiscal year ended June 30, 20xx
GNHWPCA	Greater New Haven Water Pollution Control Authority
IFO	Interim Funding Obligation
Lbs	Pounds
MGD	Million gallons per day
MGH	Million gallons per hour
O&M	Operation and maintenance
PLO	Permanent Loan Obligation

1. Introduction

1.1. Background

The Greater New Haven Water Pollution Control Authority (“GNHWPCA”) was created in 2005 to provide sewage collection and treatment service to customers in the City of New Haven and the Towns of Hamden, East Haven and Woodbridge (the “Constituent Municipalities”) and wholesale treatment service to the towns of North Haven and North Branford via interlocal agreements. Prior to creation of the GNHWPCA in 2005, the utility was owned and operated by the City of New Haven’s Water Pollution Control Authority.

The GNHWPCA is organized in accordance with Connecticut General Statutes (“CGS”) §§22a-500 to 519 inclusive (the “Act”). The purpose of the GNHWPCA is to further the environmental protection laws of the State of Connecticut and to gain efficiencies and economies of scale with respect to the planning, design, construction, management, operation and maintenance of the regional wastewater system. Since acquiring the utility, the GNHWPCA has been providing quality and affordable wastewater services to its customers.

The GNHWPCA was created to (a) operate the wastewater treatment plant and to (b) use, equip, re-equip, repair, maintain, supervise, manage, operate and perform any act pertinent to the collection, transportation, treatment and disposal of sewage with respect to the Constituent Municipalities. Currently, the daily flow at the treatment plant is approximately 29 million gallons per day (“MGD”). The treatment plant has an average daily design flow capacity of 40 MGD and provides primary and secondary treatment for all wastewater influent up to 60 MGD. During high flow events, all flow receives primary treatment; however, flow exceeding 60 MGD bypasses secondary treatment but receives disinfection along with the secondary effluent prior to discharge. The treatment plant provides the following unit processes: screening and grit removal, raw waste pumping, three primary clarifiers, four aeration trains, eight secondary clarifiers, gravity thickeners and chlorine disinfection prior to discharge. Thickened sludge is delivered to the on-site sewage sludge incinerator for processing.

The operation and maintenance of the treatment plant has been performed under contract by Operations Management International, Inc. (OMI) since 1997. This contract has been assigned to the GNHWPCA and OMI has continued with its current responsibilities. OMI is also responsible for the operation and maintenance of the regional collection system, a role it performed previously with respect to the New Haven collection system. In addition, the GNHWPCA assumed a contract with Synagro-CT, Inc. (Synagro) to

dispose of the sludge resulting from the wastewater treatment process. Synagro has provided that service at the treatment plant since 1995.

1.2. Objective and Scope

In accordance with §42 of the GNHWPCA's ordinance (the "Sewer Ordinance") the Executive Director will ensure that a cost of service study is performed at least annually. The objective of the cost of service study is to produce a schedule of recommended user rates and charges for the customers of the GNHWPCA's system which will be sufficient to meet the anticipated costs of operating the sanitary sewer system for the upcoming fiscal year.

The Cost of Service Study shall include:

- A review and evaluation of the proposed expense budget for the upcoming fiscal year, and preparation of cost estimates for the succeeding four fiscal years based on the Executive Director's cost estimates.
- A review and evaluation of the proposed revenue budget for the upcoming fiscal year, and preparation of revenue estimates for the succeeding four fiscal years based on the Executive Director's revenue estimates.
- Determination of the projected revenue requirement from user rates for the upcoming fiscal year and the succeeding four fiscal years.
- Development of a schedule of recommended rates and charges sufficient to support the estimated annual revenue requirements from user rates for the upcoming fiscal year and the succeeding four fiscal years.
- Analysis of the GNHWPCA's historical collection rate, including the current fiscal year and the Executive Director's estimate of the collection rate for the upcoming fiscal year.
- Preparation of a report documenting recommendations, assumptions and methodology.
- Such other information as required by the Executive Director from time to time.

The Executive Director shall review the results and submit the cost of service study to the GNHWPCA Board of Directors on or before the third Monday in April.

1.3. Sewer Ordinance

The GNHWPCA's ordinance governs the operation, maintenance and expansion of the regional wastewater system. In order to guarantee consolidated operation, maintenance and expansion of the regional wastewater system by the GNHWPCA, the Sewer Ordinance also acted to repeal similar ordinances of the Constituent Municipalities which previously served to govern operation, maintenance and expansion of their individual

wastewater systems. Material provisions of the Sewer Ordinance that affect this study are detailed in the sections which follow.

1.3.1. Assessment of Benefits; Benefit Charge

Pursuant to provisions contained in the Act, the GNHWPCA may levy and collect benefit assessments upon the lands and buildings within its jurisdiction, which, in its judgment, are especially benefited by a sanitary sewer, according to such rules as the GNHWPCA may adopt. No assessment shall be made until after a public hearing before the GNHWPCA, at which time the owner of the property to be assessed shall have an opportunity to be heard concerning the proposed assessment.

Assessments, including any installment thereof, are due and payable at such time as fixed by the GNHWPCA, provided no assessment shall become due until the work, or particular portion thereof for which such assessment was levied, has been completed. Any assessment of benefits, including any installment thereof, which is not paid within 30 days after the due date, is considered delinquent and will be subject to interest and will constitute a lien upon the property assessed and a charge upon the owner thereof.

1.3.2. Rates Established

Charges for sanitary sewer services furnished by the GNHWPCA for residential, commercial, industrial and institutional users are to be established and revised from time to time by the GNHWPCA. Sewer use charges are to reflect a proportional distribution of costs among all users in accordance with the Act, CGS §7-255, as amended, and the United States Code.

1.3.3. Rates for Property Located Outside the GNHWPCA's Service Territory

The charges to be made by the GNHWPCA for sewer service to property outside the limits of the GNHWPCA's service territory are to be established on the basis of a formal contract with the GNHWPCA.

1.3.4. No Reduced Rates or Free Service Permitted

All persons owning, renting, leasing or having management or control of property or premises that produce waste that is discharged into the regional wastewater system, including domestic waste, and subject to the provisions of the Sewer Ordinance, shall be charged the rates established by the GNHWPCA, and no reduced rates or free sanitary sewer services are to be furnished to any such person, property or premises.

1.3.5. Billing and Collection

Billing for sewer services is made to the GNHWPCA's customers monthly or quarterly. All sewer user charges are due and payable in full on receipt. Any charges not paid in

full within 30 days of the billing date are considered delinquent and bear interest from the due date at the rate provided pursuant to CGS for delinquent property taxes.

1.3.6. Cost of Service Study; Proposed Rates

The Executive Director of the GNHWPCA is to ensure that a cost of service study is performed at least annually. The Executive Director reviews the results of the study and shall submit the study on or before the third Monday in April to the GNHWPCA for consideration and public hearing. If the Executive Director's recommendations as to the proposed rates and charges are not disapproved, or approved with modifications by the GNHWPCA by the first day of the next fiscal year, the Executive Director's recommended rates and charges will automatically become effective until such time as they are superseded by a renewal of the above procedure. Billings for services are to be rendered as the GNHWPCA determines. In the period intervening between cost of service studies, the GNHWPCA may amend user charges so long as such charges are based upon the anticipated cost of operating the system and such charges are presented to the general public at a public hearing in accordance with CGS.

2. GNHWPCA System & Customers

2.1. Regional System Profile

Wastewater treated by the GNHWPCA at the wastewater treatment plant is discharged into Long Island Sound and must meet both federal and state effluent quality standards. The GNHWPCA was organized to ensure the necessary professional technical and skilled personnel, specialized facilities and equipment, and financial resources are available to allow it to carry its mission: “To provide reliable municipal wastewater services in compliance with applicable laws, in a cost efficient and effective method, and with the intent and desire to protect the environment and public health of the constituent municipalities.” Furthermore, its operations are expected to be financially self-sufficient.

The wastewater systems of the Constituent Municipalities include any device, equipment, appurtenance, plant facility and method for receiving, collecting, transporting, reducing, treating, reclaiming, disposing, separating or discharging sewage or the residue from the treatment of sewage. The wastewater systems may also include the purchase and/or lease of real estate and improvements thereto deemed necessary or desirable by the GNHWPCA for the purpose of establishing and providing wastewater management and water pollution control services.

Table 2-1 presents a brief summary of the wastewater systems of the GNHWPCA.

Table 2-1.
Summary of GNHWPCA Wastewater System

Service Area	53,000 acres
Treatment Plant Capacity	40 mgd
Average Daily Flow	29 mgd
Pump Stations	30
Siphons	8
Sewer Collection System	510 miles
Combined Sanitary/Storm Sewers	50 miles
Manholes	14,000
Average Age of Collection System	40 Years

Source: GNHWPCA management.

2.2. GNHWPCA Customer Base

The total number of sewer service connections (customers) is approximately 47,490 based upon information from the GNHWPCA's customer billing system. Based upon 2010 census the total population of the Constituent Municipalities was approximately 225,000. It is estimated that approximately 200,000 residents within the Constituent Municipalities currently receive sewer service from the GNHWPCA. Through interlocal agreements between the GNHWPCA and the towns of North Branford and North Haven, an additional population of approximately 1,500 is served by the GNHWPCA. As illustrated in Table 2-2, the City of New Haven is the largest Constituent Municipality representing approximately 60 percent of the population served.

**Table 2-2.
Constituent Municipality Customers Served**

Municipality	Population Served	/----- Active Customer Accounts ¹ -----/				Total
		Residential	Commercial	Industrial	Public Auth.	
New Haven	123,630	20,354	2,008	68	201	22,631
Hamden	49,510	13,594	776	34	40	14,444
East Haven	25,650	9,962	271	7	23	10,263
Woodbridge	990	294	76	-	3	373
Total	199,780	44,204	3,131	109	267	47,711

(1) GNHWPCA Customer Information System (CIS) data as of April 1, 2013.

The customer base served by the GNHWPCA consists of a diverse mix of residential and commercial customers. Customers are classified according to the nature of their use of water as well as their property ownership classification, since billing is conducted based on property ownership. Single and multifamily homes and apartment buildings are classified as "residential", manufacturing enterprises in which water is used as part of the manufacturing process are classified as "industrial", business and institutional enterprises other than those classified industrial are classified as "commercial" and municipal and other government agencies are classified as "public authority". It is important to note that in some instances there is a discrepancy between the nature of the water use and the property classification. For example, the New Haven Housing Authority is a public authority responsible for numerous residential households. The GNHWPCA classifies this customer as a public authority.

2.3. Organization & Management

2.3.1. Governance

The business of the GNHWPCA is managed by or under the direction of a Board of Directors, which may exercise all such powers of the GNHWPCA and perform all such lawful acts and activities as are allowed by the Connecticut General Statutes, as amended, and by its bylaws and ordinances.

According to provisions of the Sewer Ordinance and Section 2.2 of its bylaws, the GNHWPCA is to be governed by a qualified Board of Directors, comprised as follows:

The GNHWPCA has nine (9) Directors, each of whom shall have one vote. Four (4) Directors have been appointed from New Haven by the Mayor of New Haven, with the approval of the Board of Aldermen of New Haven. Two (2) Directors have been appointed from East Haven by the Mayor of East Haven, with the approval of the Town Council of East Haven. Two (2) Directors have been appointed from Hamden by the Mayor of Hamden, with the approval of the Town Council of Hamden. One Director has been appointed from Woodbridge by the First Selectman of Woodbridge, with the approval of the Board of Selectmen of Woodbridge.

The Directors are appointed for three year staggered terms as outlined in detail in the bylaws and ordinance. In any single year, no more than three (3) Directors' terms are scheduled to expire at one time, thereby designed to institutionalize a continuity of governance.

All business of the GNHWPCA is managed and directed by the Board of Directors, as allowed by CGS and the GNHWPCA's bylaws.

The GNHWPCA's bylaws may be revised by the affirmative vote of no less than two-thirds of the Directors in accordance with CGS §22a-501(a) (1), as amended. However, the bylaws provide that any amendment to include new constituent municipalities shall require a unanimous affirmative vote of the Board of Directors.

The current membership of the Board is as follows:

**Table 2-3.
Current Board of Directors**

Name/Title	Appointed By	Term Expires
Stephen A. Mongillo, Chairman	Hamden	12/31/13
Joyce Alton, Director	New Haven	12/31/13
Clayton Williams, Director	New Haven	12/31/13
Alphonse Paolillo, Jr., Vice Chairman	New Haven	12/31/14
Russell N. Cyr, Director	Hamden	12/31/14
Vincent Arpino, Director	East Haven	12/31/14
Anthony Criscuolo, Director	East Haven	12/31/15
Jeffrey D. Ginzberg, Director	Woodbridge	12/31/15
Michael Fimiani, Director	New Haven	12/31/15

According to the bylaws, a majority vote of the Directors is required to approve all business transactions of the GNHWPCA. Certain matters, such as entering into an agreement with respect to the distribution of rights and properties of the GNHWPCA upon the termination of its corporate existence, entering into or approving any sludge agreement, entering into any inter-local agreement, entering into any agreement with respect to the sale or lease of assets of the GNHWPCA which would leave the GNHWPCA without a significant continuing business activity, removal of a Director, awarding of a contract by negotiation without public bidding; amending, modifying, restating or replacing the Sewer Ordinance, and increasing the permitted processing capacity of the GNHWPCA's treatment plant, each would require a 2/3rds vote of the Directors.

The Board establishes insurance, health care, retirement, and other employee benefits as it deems necessary and convenient for the effective administration of the GNHWPCA. Key management positions are designed in each functional area under the major divisions of administration, engineering and operations to address the operation, maintenance and management of the regional wastewater system by the GNHWPCA.

2.3.2. Management and Staff

The GNHWPCA is headed by an Executive Director, who is responsible for all technical and administrative operations of the GNHWPCA and the implementation of programs, policies and procedures at the direction of the Board. Key management staff members are as follows:

Sidney Holbrook, Executive Director. Mr. Holbrook is the Executive Director of the GNHWPCA. He has more than 30 years of wastewater, environmental and

public management experience. Mr. Holbrook has served as the Executive Director of the GNHWPCA since 2009. Prior to this position, he owned and operated the Monoflo Septic Tank Co., Inc. in Westbrook, Connecticut and was the principal of SJH Associates which provided Environmental Consulting Services. Mr. Holbrook also served as Governor John Rowland's Chief of Staff from 1997 to 2002, directly overseeing sixteen (16) State agencies including the Department of Environmental Protection, Department of Transportation, Department of Public Health and Department of Social Services. Prior to his tenure as Chief of Staff, Mr. Holbrook served as the Commissioner of the Department of Environmental Protection. On May 10, 2011, Mr. Holbrook was recognized by the National Association of Clean Water Agencies in Washington, D.C. with a Public Service Award for his dedication to Environmental Stewardship. As Executive Director, his responsibilities include managing and directing all administrative, operational and financial activities and programs of the GNHWPCA.

Gabriel Varca, Treasurer/Director of Finance and Administration. Mr. Varca is the Treasurer and Director of Finance and Administration. For 24 years, Mr. Varca previously held various operations and management positions with the New Haven Water Pollution Control Authority ("NHWPCA"). He assists the Executive Director in the creation of the operating budget and capital improvement plan budget and is responsible for the financial operations of the GNHWPCA, including accounting, finance, billing and collections. Mr. Varca earned a B.S. in Accounting from Connecticut State University.

Gary Zrelak, Director of Operations. Mr. Zrelak is the Director of Operations. He has over 28 years of experience in wastewater operations. His responsibilities include supervising and managing the performance of the GNHWPCA's contract operator for the water pollution control facilities, sanitary sewer collection systems and pumping stations within State and Federal regulations. Prior to his employment by the Authority, Mr. Zrelak was the Process Control Superintendent for the NHWPCA for more than seven years. Mr. Zrelak earned a B.S. in Agronomy, College of Agriculture, University of Connecticut and a MS Degree in Environmental Science from the University of New Haven. He also holds a Class IV Wastewater Operators License from the Connecticut Department of Environmental Protection and a Class IV Collection Systems License from the New England Water Pollution Control Association.

Thomas Sgroi, P.E., Director of Engineering. Mr. Sgroi is the Director of Engineering for the GNHWPCA. Mr. Sgroi has over 23 years of engineering and construction management experience. His responsibilities include completion of executive management work for the Authority's planning and engineering programs, which include design, construction, utility services, GIS, mapping, records management and capital improvement projects. Mr. Sgroi earned a B.S. in

Civil Engineering from the University of Hartford. He is also a Licensed Professional Engineer in the State of Connecticut.

Employees of the private entities responsible for the operations and sludge management contracts are not employees of the GNHWPCA. Currently, the staff of the GNHWPCA consists of 37 full and part-time employees. The operation and maintenance of the treatment plant and collection system and sludge incinerator are contracted to OMI (29 employees) and Synagro (11 employees), respectively. An organization chart is included as Exhibit 5.

2.3.3. Contracted Operations

2.3.3.1. Operations Management International, Inc. ("OMI")

The comprehensive agreement with OMI provides for the operation, maintenance and management by OMI of the System, including the East Shore Treatment Plant, pump stations and collection systems. This agreement establishes performance and reporting requirements for the operation and maintenance of the system. The agreement requires the implementation of a maintenance management program to include preventive, predictive, and corrective maintenance for all components of the system, including:

- Buildings, grounds, and structures
- Electrical systems and instrumentation
- Mechanical equipment
- Odor control systems
- Sewers and manholes
- Storm sewers
- Vehicles and other related rolling stock
- Laboratory, monitoring and sampling equipment
- Heating, ventilation, and air conditioning
- Communication equipment
- Computer systems (software and hardware)
- Chemical feed systems
- Pumping systems
- Auxiliary power facilities
- Air pollution control devices
- Supervisory Control and Data Acquisition (SCADA) facilities
- Other facilities, equipment, and systems contained within the system
- Other specialized tools and equipment

OMI is responsible for all utility costs, with the exception of electricity which is a pass-through cost subject to a maximum utilization limit. OMI is also required to deliver biosolids to a sludge holding tank in accordance with the provisions of the Synagro contract. The agreement with OMI expires in 2014. Management is currently evaluating its alternatives for contracted operations beyond the current term of its agreement with OMI, and does not anticipate any significant changes to its overall cost structure.

Denver-based OMI is a privately owned company and an affiliate of CH2M Hill Companies, Ltd. This international company provides services to approximately 130 million customers of government and industry throughout the world.

2.3.3.2. Synagro

The GNHWPCA's contract with Synagro provides for the receipt and disposal of sludge generated at the East Shore Treatment Plant. The sludge is delivered by OMI and incinerated at the on-site multiple hearth facility. In accordance with the agreement, Synagro is allowed to solicit sludge from other entities (outside sludge), in addition to the sludge delivered by OMI, to utilize the capacity of the on-site incinerator. The Agreement provides for revenue sharing from the receipt of outside sludge between the GNHWPCA and Synagro. Synagro is responsible for the disposal of all ash and by-products generated by the incinerator in compliance with applicable laws and regulations. In addition, Synagro is responsible for odor control associated with the sludge incineration facilities.

2.3.4. Powers of the GNHWPCA

The GNHWPCA has the power to set rates, bill customers and take appropriate action for collection of delinquent accounts or non-conforming users. The GNHWPCA is a regional water pollution control authority formed in accordance with CGS §§22a-500 to 519, which provides powers of municipalities to the GNHWPCA. CGS §22a-501 sets forth in greater detail the powers of a regional water pollution control authority to set rates.

2.3.4.1. Cost Allocation

The initial goal of the GNHWPCA was to have one uniform blended rate for all Constituent Municipalities. This study is being conducted to develop a schedule of recommended sewer user rates sufficient to support the estimated cost of service to all users in the regional wastewater system.

2.3.4.2. Procedures for Establishing Rates and Charges

The GNHWPCA is empowered to establish and impose just and equitable fees, rates, charges, and penalties and levy assessments of property benefited by the wastewater system for any services it performs. The Board of Directors is responsible for approval of all fees, rates, charges and penalties. Rates are based on metered water flow use and billed directly to the user on a quarterly basis unless otherwise specified.

Rates are determined based on the proposed budget and the annual cost of service study, to be considered by the GNHWPCA and the general public and noticed in accordance with state statutes and applicable ordinances and by-laws.

Such charges are to reflect a proportional distribution of costs among all users in accordance with CGS §7-255, as amended from time to time, §204(b) of 33 USC, Section 1284(b) and the Act. No reduced rates or free service are to be permitted. Prior to the establishment of a fee, rate, charge, penalty or assessment, the Board of Directors must hold a public hearing at which all users of the wastewater system will have had an opportunity to be heard concerning any such proposed fee, rate, charge, penalty or assessment.

2.3.4.3. Budget Approval

In accordance with CGS §§22a-500 to 519, and the Sewer Ordinance, the GNHWPCA must ensure a cost of service study is conducted at least annually. The study is to be reviewed by the Executive Director and submitted each year with a schedule of recommended rates and charges for the next fiscal year. In the period intervening cost of service studies, the GNHWPCA is authorized to amend user charges provided such charges are based upon the anticipated cost of operating the system and are presented at a public hearing, properly noticed.

The annual budget of the next fiscal year's projected revenue and expenditures and recommended sewer user charges are to be submitted to the Directors and filed with the City/Town Clerks in the City of New Haven and Towns of East Haven, Hamden, and Woodbridge by the Executive Director on or before the third Monday in April and, within ten calendar days after such submission, are to be published once in a daily newspaper having circulation in the City of New Haven and Towns of East Haven, Hamden, and Woodbridge. After such publication, but no earlier than ten calendar days after public notice thereof, the GNHWPCA is to hold a public hearing on such projected revenue and expenditures and recommended sewer user charges and consider and act on such projected revenues and expenditures and recommended sewer user charges on or before the first Monday in June.

The Executive Director is required to submit one copy of the annual operating budget of the GNHWPCA to the State of Connecticut Office of Policy and Management by July 1st of each year or within thirty calendar days after the adoption of the budget, whichever is later (CGS §22a-502.). The budget and sewer use charge, if said charge is revised by the GNHWPCA, shall be filed with the City/Town Clerks and published in a daily newspaper having circulation in the City of New Haven and Towns of East Haven, Hamden, and Woodbridge no later than five calendar days after their filing.

2.3.5. Billing & Collection

All billing and collection is coordinated through the Customer Service Department of the GNHWPCA. The costs associated with the GNHWPCA's billing and collection activities and certain of its administrative and accounting costs are recovered through an administrative charge applied to each bill. The GNHWPCA estimates it will produce a total of 192,000 bills in FY14.

2.3.5.1. Billing Procedures

Customers of the GNHWPCA are classified according to the nature of their water consumption. All homes, dormitories and apartment buildings are classified as residential, all manufacturing enterprises in which water is used as part of the manufacturing process are classified as industrial, and all business and institutional enterprises other than those classified industrial are classified as commercial. Municipal and other public entities are classified as public authority. The wastewater customers are billed for wastewater services based on their metered water consumption, as determined by the RWA.

In general, customers are billed on a quarterly basis. Approximately 580 (primarily large volume) customers are billed on a monthly basis. The billings to the approximately 22,600 customers in New Haven takes place in July, October, January and April. The billings to the approximately 25,000 customers in East Haven, Hamden and Woodbridge takes place in August, November, February and May.

Key provisions of the GNHWPCA's billing and collections policy include:

- Bills not paid within 30 days from the billing date are subject to interest at a rate of 1.5 percent per month from the dated billed.
- A delinquent account is sent to a collection agency after the amount owed is \$90 or greater than 90 days old.
- When an account is sent for collection, the collection fee is added to the bill of the delinquent customer for reimbursement.
- Payments not received continue for further collection procedures under tax warrant or foreclosure proceedings.

The GNHWPCA also employs CheckFree payment services from Fiserv, Inc, which allows customers to pay their bills at several retail chains throughout the service area.

3. Financial Management

3.1. Introduction

In accordance with CGS §§55b-111 to 112, the GNHWPCA operates as a municipality for the purpose of compliance with auditing and finance requirements. The GNHWPCA can establish eligibility to apply for financing from the Clean Water Fund under the provisions of CGS §§22a-477 to 483. Tax-exempt bond issues serve as the primary capital funding mechanism for the GNHWPCA. The bonds are issued to fund capital improvements periodically, depending on the GNHWPCA's capital requirements. The issuance of the bonds is in accordance with the requirements and provisions of CGS §22a-507.

3.2. Rate Covenants

At its inception, the GNHWPCA issued \$91,290,000 in revenue bonds (Series 2005A) to purchase system assets, refund existing debt and fund reserves. The rate covenant entered into in conjunction with these bonds, and the ability to raise rates are the primary factors that provide the GNHWPCA with credit strength. As is the case with most utility financing, the GNHWPCA has entered rate covenants requiring management to set rates for service that will generate net revenues sufficient to provide a defined minimum level of cash flow in excess of debt service requirements. The Indenture of Trust for the GNHWPCA's bonds (the "Indenture") requires debt service coverage of 115% (i.e., excess cash flows equal to 15% of debt service must be incorporated into sewer rates). In addition, rates must cover operating and maintenance expenses, and contributions to reserve funds for future system improvements, expansions, or replacements. Sufficient revenues, or reserves, should also be available for unexpected emergencies such as flood damage or sewer main breaks.

Pursuant to the Indenture, the GNHWPCA covenants that it will fix, charge and collect rates, charges, rents, fees and assessments, including but not limited to use and connection charges and benefit assessments, which will produce revenues which shall be sufficient in each fiscal year to provide for the following:

- A debt service coverage ratio of at least 115% of the debt service cash requirements;
- Any amount necessary to restore any account within a debt service reserve fund to its required deposit level; and
- Any amount necessary to restore any debt service reserve fund for parity indebtedness to its required deposit level.

For purposes of calculating debt service coverage pursuant as required by the Indenture, it is also necessary to incorporate reimbursements from the City of New Haven for its share of principal payments on Clean Water Fund ("CWF") notes related to sewer-separation projects. The GNHWPCA has established a receivable for the total that will be reimbursed by the City. This additional element of cash flows is not found in the GNHWPCA's statements of revenues and expenditures.

Table 3-1 below details the debt service coverage provided for the years ended June 30, 2008 through 2012.

**Table 3-1.
Debt Service Coverage Calculation**

	FY08	FY09	FY10	FY11	FY12
Cash Flows from User Charges					
Total operating revenues	\$ 27,364,780	\$ 28,091,156	\$ 29,465,175	\$ 33,889,949	\$ 35,157,176
Depreciation	2,756,088	3,518,958	3,990,933	4,376,673	4,498,847
Total operating expenses	(22,422,025)	(22,984,592)	(23,712,433)	(23,821,808)	(25,640,527)
Interest income	1,046,354	634,521	293,192	280,074	278,166
Reimbursement - New Haven CWF interest	214,668	201,101	184,152	167,016	173,873
Reimbursement - New Haven CWF principal	842,399	842,198	853,937	830,146	1,006,880
Transfers from rate stabilization fund	1,337,213	763,406	825,237	-	-
Net cash flows from user charges	11,139,477	11,066,748	11,900,193	15,722,050	15,474,415
Debt Service					
Principal payments on debt	3,795,061	4,066,446	4,446,856	4,675,380	5,197,046
Interest paid on debt	4,990,997	5,409,721	5,498,087	5,479,683	5,556,261
Total debt service payments	8,786,058	9,476,167	9,944,943	10,155,063	10,753,307
Debt service coverage ratio	1.27	1.17	1.20	1.55	1.44

Source: GNHWPCA audited financial statements.

The GNHWPCA has provided a covenant that each fiscal year, it will budget for rates, charges, rents, fees and assessments, including but not limited to use and connection charges and benefit assessments, which will produce revenues which, together with amounts capitalized from proceeds of bonds or otherwise made available and reserved and not already taken into account by reduction of the obligations which are to be paid from revenues and the amount to be withdrawn from a surplus fund other than to pay capital costs for such fiscal year, will be sufficient in each fiscal year to provide for an amount equal to 100% of the aggregate debt service for such fiscal year with respect to subordinated indebtedness.

3.3. Reserve Accounts

A fully funded debt service reserve account provides an additional level of security for bondholders. When an unexpected budget shortfall occurs, the reserve fund will allow the GNHWPCA time to implement necessary adjustments before bondholders are adversely affected. The usual debt service reserve requirement is equal to the least of 125% of average annual debt service, 10% of aggregate bond debt service, or maximum annual debt service. A fully funded debt service reserve has an impact on the

GNHWPCA's rating and may be essential for an investment grade rating. However, it is also understood that the debt service reserve is really a liquidity source and provides only limited additional security to bondholders.

Reserve accounts totaling approximately \$14.5 million were funded by the GNHWPCA's initial bond issuance. They included a General Fund (operating reserves and funds identified to meet debt service coverage requirements), Clean Water Fund Debt Service Reserves (50% of maximum aggregate annual debt service on CWF notes) and the Debt Service Reserve Fund (100% of maximum aggregate annual debt service on revenue bonds). For utilities that consistently maintain high operating reserves and sustain high debt service coverage levels, the debt service reserve fund may be less relevant.

The GNHWPCA has established an Infrastructure Renewal Fund, which is used to accumulate reserves to fund ongoing capital projects in lieu of borrowing. This program is funded primarily from the annual cash flow generated by the debt service coverage requirement.

Consistent with prevailing credit rating criteria and its plan of operations, it is assumed that the GNHWPCA will consider the following factors when developing and managing its credit structure:

- **System Size and Assessment Base.** Since the GNHWPCA serves a diverse customer base already, it will seek expansion only when considered to be both operationally and financially appropriate.
- **Governance.** The GNHWPCA's operations are governed in accordance with its bylaws, which provides for the GNHWPCA to establish rates, manage staff, and approve capital improvements, among other responsibilities.
- **Strategic Focus.** The GNHWPCA considers multi-year capital improvement programs that include current and anticipated capital needs that cover asset maintenance, upgrades, and system expansions.
- **Rates, Rate Structure, and Rate Making Flexibility.** The GNHWPCA will evaluate whether rates and revenues cover all financial commitments, inclusive of reserves for emergencies, and whether they are reasonable and affordable, which could affect asset maintenance and expansion of the user base.
- **Additional Considerations.** The GNHWPCA is seeking to build reserve balances over time to establish reliable operating reserves and fund an appropriate share of the ongoing capital improvements from operating funds.

The GNHWPCA is intent on establishing the best credit rating it can attain in order to minimize the impact of borrowing costs.

4. Determination of Rates

4.1. Scope and Methodology

In providing adequate wastewater treatment services to its customers, the GNHWPCA must receive sufficient total revenue to ensure the following objectives:

- Meet legal and contractual requirements, including the terms of the Indenture;
- Maintain current service levels;
- Meet new demands for service;
- Adequately maintain the existing collection and treatment systems; and
- Plan for future needs in an orderly manner.

Regulations established by the U.S. Environmental Protection Agency and Connecticut Department of Energy & Environmental Protection require user fee systems for pollution abatement facilities to produce revenues sufficient to support the operations, maintenance and replacement of facilities. This is the key element in the determination of the rates to be charged to users, since it is intended that the operation of such facilities should be self-supporting. The State and Federal governments have mandated that the viability of such operations should not be compromised. Accordingly, sewer user rates should be set at levels sufficient to recover all costs necessary to finance adequate wastewater treatment and disposal.

4.2. Cost Projections and Determination of Revenue Requirement

The first step to developing appropriate rates is to determine the costs associated with planned future operations. Based on these cost projections and any projected miscellaneous revenues (other than those that will be generated from rates), an annual revenue requirement is established. This represents the amount that must be generated from sewer user charges.

For purposes of this study, the total cost estimates used for FY14 through FY18 were based upon the proposed operating budget for FY14, historical and anticipated trends, and a review of individual budget line-items. The average annual growth rate of costs was developed by management based upon projected needs and historical experience. We also considered those developments in the current year that may affect cost estimates on a significant scale going forward.

This cost of service study incorporates the following cost components:

4.2.1. Operations and Maintenance Costs

Operations and maintenance costs include all costs necessary to deliver wastewater collection and treatment services. It includes not only the technical operation of the plant facilities and collection system, but also the administrative resources employed to ensure efficient operations as well as fixed administrative resources employed to administer the GNHWPCA.

4.2.2. Debt Service

In recognizing costs, cash outlay is the determinant used for cost recovery. Rather than using depreciation, the debt service requirement resulting from the acquisition and construction of assets is used. According to EPA guidelines on establishing cost recovery systems, this is an acceptable method for recognizing costs. Therefore, principal and interest payments are among the costs to be recovered by user fees. Exhibit 3 details the debt service costs for FY14 through FY18.

4.2.3. Estimated Future Debt Service

The cost estimates include a provision for estimated debt service associated with future bond issues to finance planned capital improvements. Based on the GNHWPCA's capital improvement plan for FY14 through FY18 (see Exhibit 4), we have estimated future debt service using the following assumptions:

- Management's assessment of the portion of costs to be financed by Clean Water Fund grants and notes.
- Management's assessment of the project costs that will be shared with the City of New Haven (i.e., 40% of each sewer separation project).
- Revenue bonds to be issued periodically, at a rate of 5% for 30 years, and amortization with level payments.
- Projects financed with Clean Water Fund notes are financed with an Interim Funding Obligation (IFO) until project completion. At completion, IFO's convert to Permanent Loan Obligations (PLO) with payment of 5% of principal outstanding and amortization of the remaining balance over 20 years at 2% with level payments. Interest accrued prior to conversion to PLO is assumed to be included in the amount borrowed under the IFO.
- For purposes of this study, based on management's capital improvement plan, we have assumed the timing and amount of future borrowings as follows:
 - Issuance of new revenue bonds of \$15,000,000 in FY16.
 - CSO Projects – Shared with the City of New Haven
 - Execution of a Permanent Loan Obligation of \$8,364,000 in December 2013 (Yale/Trumbull Project, Phase I)
 - Execution of a PLO of \$5,330,000 in FY16 (Yale/Trumbull Project, Phase II)

- Execution of a PLO of \$19,000,000 in FY18 (Sewer Separation – Various Locations)
- Non-CSO Projects
 - Execution of a PLO of \$667,000 in May 2013 (Fats/Oils/Grease Facility)
 - Execution of a PLO of \$3,625,000 in FY14 (Wet Weather/Nitrogen Improvements - Design)
 - Execution of a PLO of \$47,300,000 in FY17 (Wet Weather/Nitrogen Improvements - Construction)

4.2.4. Miscellaneous Revenues

Miscellaneous revenues (i.e., revenues from all sources other than sewer user charges) are deducted from the total cost of services to determine the net revenue requirement. Miscellaneous revenues for FY14 are based on management's proposed budget. The average annual growth rate of revenues was determined by management based upon projected needs and historical experience.

4.2.5. Debt Service Coverage Requirement

As detailed in Section 3.2 of this report, the GNHWPCA is required under the Indenture of Trust for the Series 2005A bonds to include a provision for additional revenues in its user charges equal to 15% of annual debt service. This provision does not apply, however, to the extent that management has identified and restricted existing reserves equal to all or part of this amount that are not otherwise restricted. Notwithstanding this exception, the GNHWPCA includes the full 15% requirement in its budget each year and provides for an offsetting use of reserves as applicable. We have followed the same approach for purposes of this study.

4.2.6. Use of Reserve Funds

Maintenance of reserve funds may increase or reduce the GNHWPCA's revenue requirement in any given year. Management has not planned to incorporate any use or funding of reserves in its FY14 budget.

4.2.7. Receivable Management Costs

Receivable management costs are the estimated portion of billings to customers each year that are not collected during the period. The GNHWPCA implemented a new customer information system in 2010. Management has been able to utilize the CIS system to monitor billing and collections data on a monthly basis. The GNHWPCA's one-year collection rate has declined slightly in recent years due to the poor economy. Write-offs are minimal due to GNHWPCA's ability to place liens on real property, and the long-term collection rate on receivables remains above 95%.

4.3. Development and Design of Rates and Charges

4.3.1. Objectives

The primary objective in the recommendation of rates is to establish rates that will generate sufficient revenues to meet the total revenue requirements. Billing is based on water consumption using data provided by the RWA stated in 100 cubic foot units ("CCF's"). For purposes of recommending a user rate for FY14, we have assumed billable consumption of 8,650,000 CCF based on management's assessment of consumption trends.

4.3.2. Recommended Rate

As detailed further in Table 4-1 and Exhibit 1, based upon our assessment of management's budgeted revenues and expenses for FY14 and other assumptions detailed herein, we recommend a quarterly administrative charge of \$13.00 and a CCF rate of \$3.55 for FY14.

**Table 4-1.
FY14 Recommended User Rate
FY15 through FY18 Projected Rates**

Fiscal Year	Estimated Consumption	Admin Fee	CCF Rate	% Change in CCF Rate	Estimated Billings
FY14	8,650,000	\$ 13.00	\$ 3.55	7.7%	\$ 33,241,000
FY15	8,650,000	13.00	3.77	6.0%	35,081,000
FY16	8,650,000	13.00	4.02	6.8%	37,303,000
FY17	8,650,000	13.00	4.38	8.9%	40,406,000
FY18	8,650,000	13.00	4.75	8.5%	43,611,000

4.3.3. Flat Rates for Well Users

The GNHWPCA currently has sewer customers who are not customers of the RWA (i.e., customers whose water supply is from wells), and therefore have no basis for sewer billing. We recommend that customers of the GNHWPCA, who are not customers of the RWA, continue to be billed on the basis used in previous years. Customers who are well users were asked to complete a survey that collects information about their respective dwellings and inhabitants. Based upon the results of this survey, the customer is billed a flat amount each quarter based on consumption of 15, 20 or 24 CCF's.

5. Exhibits

Exhibits 1 through 5 are found on Pages 5-2 through 5-6.

Exhibit 1

Revenue Requirement and Recommended User Rates
For the fiscal year ended June 30, 2014
With Estimated Revenue Requirements and User Rates for Fiscal Years 2015 through 2018

Line No.	Description	1 FY14	2 % ch.	3 FY15	4 % ch.	5 FY16	6 % ch.	7 FY17	8 % ch.	9 FY18
A. OPERATIONS & MAINTENANCE										
1	Personnel	\$ 4,811,290	5%	\$ 5,056,000	5%	\$ 5,315,000	5%	\$ 5,591,000	5%	\$ 5,891,000
2	Utilities	4,082,650	2%	4,165,000	2%	4,248,000	2%	4,333,000	2%	4,419,000
3	Contracted Operations - Collection System	6,545,500	8%	7,069,000	6%	7,493,000	3%	7,718,000	3%	7,950,000
4	Contracted Sludge & Ash Disposal	4,694,600	5%	4,929,000	5%	5,175,000	5%	5,434,000	5%	5,706,000
5	Other Contracted Services	3,597,200	3%	3,705,000	3%	3,812,000	3%	3,927,000	3%	4,043,000
6	Payments In-lieu of Taxes (PILOT)	749,700	0%	750,000	0%	750,000	0%	750,000	0%	750,000
7	Equipment, Vehicles & Supplies	216,600	3%	224,000	3%	231,000	3%	238,000	3%	245,000
8	Contingency	400,000	0%	400,000	0%	400,000	0%	400,000	0%	400,000
9	Total Operations & Maintenance Costs	25,097,540	5%	26,298,000	4%	27,424,000	4%	28,391,000	4%	29,404,000
B. DEBT SERVICE										
Revenue Bonds:										
10	Principal	2,711,667	4%	2,821,667	5%	2,956,667	12%	3,312,667	5%	3,463,667
11	Interest	5,119,668	-2%	5,011,387	12%	5,633,870	-2%	5,499,053	-3%	5,345,787
Clean Water Fund Notes:										
12	Principal	3,189,593	-12%	2,793,958	13%	3,162,684	74%	5,513,082	0%	5,530,074
13	Interest	625,198	7%	667,225	3%	685,948	39%	955,048	54%	1,474,064
CWF Notes - New Haven Reimbursement:										
14	Principal	(1,008,647)	-10%	(902,981)	17%	(1,056,071)	-16%	(886,207)	-1%	(878,719)
15	Interest	(196,117)	7%	(210,232)	6%	(222,045)	-4%	(213,845)	-8%	(196,168)
16	Total Debt Service	10,441,363	-2%	10,181,023	10%	11,161,052	27%	14,179,798	4%	14,738,705
17	TOTAL COST OF SERVICES	\$ 35,538,903	3%	\$ 36,479,023	6%	\$ 38,585,052	10%	\$ 42,570,798	4%	\$ 44,142,705
C. MISCELLANEOUS REVENUES										
18	Interest & Lien Fees	(1,280,000)	0%	(1,280,000)	0%	(1,280,000)	0%	(1,280,000)	0%	(1,280,000)
19	Aged Accounts Receivable	(3,000,000)	0%	(3,000,000)	0%	(3,000,000)	0%	(3,000,000)	0%	(3,000,000)
20	Investment Income	(275,000)	0%	(275,000)	0%	(275,000)	0%	(275,000)	0%	(275,000)
21	High Strength Surcharges	(800,000)	0%	(800,000)	0%	(800,000)	0%	(800,000)	0%	(800,000)
22	Grease Disposal	(285,000)	0%	(285,000)	0%	(285,000)	0%	(285,000)	0%	(285,000)
23	Outside Sludge	(1,000,000)	0%	(1,000,000)	0%	(1,000,000)	0%	(1,000,000)	0%	(1,000,000)
24	Interlocal Fees	(50,000)	0%	(50,000)	0%	(50,000)	0%	(50,000)	0%	(50,000)
25	Reimbursements - OM/Synagro	(600,000)	0%	(600,000)	0%	(600,000)	0%	(600,000)	0%	(600,000)
26	Other Revenues	(640,000)	0%	(640,000)	0%	(640,000)	0%	(640,000)	0%	(640,000)
27	Total Miscellaneous Revenues	(7,930,000)	0%	(7,930,000)	0%	(7,930,000)	0%	(7,930,000)	0%	(7,930,000)
D. SOURCE/(USE) OF RESERVES										
28	Debt Service Coverage Requirement	1,747,000		1,694,000		1,866,000		2,292,000		2,372,000
29	Debt Service Sinking Fund	-		750,000		450,000		(1,200,000)		-
30	Total Source/(Use) of Reserve Funds	1,747,000		2,444,000		2,316,000		1,092,000		2,372,000
31	NET REVENUE REQUIREMENT	\$ 29,355,903	6%	\$ 30,993,023	6%	\$ 32,971,052	8%	\$ 35,732,798	8%	\$ 38,584,705
32	E. RECEIVABLE MANAGEMENT COSTS	3,885,000		4,088,000		4,332,000		4,673,000		5,026,000
33	Estimated collection rate	89%		89%		89%		89%		89%
34	REVENUE REQUIREMENT	\$ 33,240,903	6%	\$ 35,081,023	6%	\$ 37,303,052	8%	\$ 40,405,798	8%	\$ 43,610,705
35	Debt Service Coverage Ratio	1.15		1.15		1.15		1.15		1.15
36	Consumption	8,650,000		8,650,000		8,650,000		8,650,000		8,650,000
37	Number of bills	192,000		192,000		192,000		192,000		192,000
38	Administrative fee	\$ 13.00		\$ 13.00		\$ 13.00		\$ 13.00		\$ 13.00
39	CCF Rate	\$ 3.55		\$ 3.77		\$ 4.02		\$ 4.38		\$ 4.75
		7.7%		6.0%		6.8%		8.0%		8.5%

Exhibit 2

Budgeted Operations & Maintenance Expenses by Department
For the fiscal year ended June 30, 2014
With Estimated Expenses for Fiscal Years 2015 through 2018

Line No.	Description	1 FY14	2 % ch.	3 FY15	4 % ch.	5 FY16	6 % ch.	7 FY17	8 % ch.	9 FY18
EXECUTIVE DIRECTOR										
1	Personnel	\$ 365,213	2%	\$ 374,000	2%	\$ 382,000	2%	\$ 390,000	2%	\$ 399,000
2	Other Contracted Services	762,450	3%	785,000	3%	806,000	3%	831,000	3%	856,000
3	Equipment, Vehicles & Supplies	61,100	3%	63,000	3%	65,000	3%	67,000	3%	69,000
4	Contingency	400,000	0%	400,000	0%	400,000	0%	400,000	0%	400,000
5	Total EXECUTIVE DIRECTOR	1,588,763	2%	1,622,000	2%	1,653,000	2%	1,688,000	2%	1,724,000
FINANCE & ADMINISTRATION										
6	Personnel	714,184	3%	738,000	3%	761,000	3%	785,000	3%	811,000
7	Other Contracted Services	114,500	3%	118,000	3%	121,000	2%	124,000	2%	127,000
8	Total FINANCE & ADMINISTRATION	828,684	3%	856,000	3%	882,000	3%	909,000	3%	938,000
CUSTOMER SERVICE										
9	Personnel	772,432	3%	798,000	3%	824,000	3%	850,000	3%	877,000
10	Other Contracted Services	510,000	3%	526,000	3%	542,000	3%	559,000	3%	576,000
11	Equipment, Vehicles & Supplies	9,000	0%	9,000	0%	9,000	0%	9,000	0%	9,000
12	Total CUSTOMER SERVICE	1,291,432	3%	1,333,000	3%	1,375,000	3%	1,418,000	3%	1,462,000
EMPLOYEE BENEFITS										
13	Personnel	1,365,380	10%	1,501,000	10%	1,651,000	10%	1,815,000	10%	1,996,000
14	Other Contracted Services	65,000	3%	67,000	3%	69,000	3%	71,000	3%	73,000
15	Total EMPLOYEE BENEFITS	1,430,380	10%	1,568,000	10%	1,720,000	10%	1,886,000	10%	2,069,000
ENGINEERING										
16	Personnel	769,522	3%	794,000	3%	819,000	3%	845,000	3%	872,000
17	Other Contracted Services	303,000	3%	312,000	3%	321,000	3%	331,000	3%	341,000
18	Total ENGINEERING	1,072,522	3%	1,106,000	3%	1,140,000	3%	1,176,000	3%	1,213,000
OPERATIONS										
19	Personnel	824,559	3%	851,000	3%	878,000	3%	906,000	3%	936,000
20	Utilities	4,024,000	2%	4,105,000	2%	4,187,000	2%	4,271,000	2%	4,356,000
21	Contracted Operations - Collection System	6,545,500	8%	7,069,000	8%	7,493,000	3%	7,718,000	3%	7,950,000
22	Contracted Sludge & Ash Disposal	4,694,600	5%	4,929,000	5%	5,175,000	5%	5,434,000	5%	5,706,000
23	Other Contracted Services	1,489,550	3%	1,534,000	3%	1,580,000	3%	1,628,000	3%	1,677,000
24	Equipment, Vehicles & Supplies	90,000	3%	93,000	3%	96,000	3%	99,000	3%	102,000
25	Total OPERATIONS	17,668,209	5%	18,581,000	4%	19,409,000	3%	20,056,000	3%	20,727,000
GENERAL SERVICES										
26	Utilities	58,650	2%	60,000	2%	61,000	2%	62,000	2%	63,000
27	Other Contracted Services	352,700	3%	363,000	3%	373,000	3%	383,000	3%	393,000
28	Payments In-lieu of Taxes (PILOT)	749,700	0%	750,000	0%	750,000	0%	750,000	0%	750,000
29	Equipment, Vehicles & Supplies	56,500	4%	59,000	3%	61,000	3%	63,000	3%	65,000
30	Total GENERAL SERVICES	1,217,550	1%	1,232,000	1%	1,245,000	1%	1,258,000	1%	1,271,000
ALL DEPARTMENTS										
31	Personnel	4,811,290	5%	5,056,000	5%	5,315,000	5%	5,591,000	5%	5,891,000
32	Utilities	4,082,650	2%	4,165,000	2%	4,248,000	2%	4,333,000	2%	4,419,000
33	Contracted Operations - Collection System	6,545,500	8%	7,069,000	8%	7,493,000	3%	7,718,000	3%	7,950,000
34	Contracted Sludge & Ash Disposal	4,694,600	5%	4,929,000	5%	5,175,000	5%	5,434,000	5%	5,706,000
35	Other Contracted Services	3,597,200	3%	3,705,000	3%	3,812,000	3%	3,927,000	3%	4,043,000
36	Payments In-lieu of Taxes (PILOT)	749,700	0%	750,000	0%	750,000	0%	750,000	0%	750,000
37	Equipment, Vehicles & Supplies	216,600	3%	224,000	3%	231,000	3%	238,000	3%	245,000
38	Contingency	400,000	0%	400,000	0%	400,000	0%	400,000	0%	400,000
39	Total ALL DEPARTMENTS	\$ 25,097,540	5%	\$ 26,298,000	4%	\$ 27,424,000	4%	\$ 28,391,000	4%	\$ 29,404,000

Exhibit 3

Scheduled and Estimated Debt Service
For the fiscal years ended June 30, 2014 through 2018

Line No.	Description	1 FY14	2 % ch.	3 FY15	4 % ch.	5 FY16	6 % ch.	7 FY17	8 % ch.	9 FY18
Revenue Bonds										
2005 Series A										
1	Principal	\$ 1,965,000	4%	\$ 2,050,000	5%	\$ 2,160,000	5%	\$ 2,270,000	5%	\$ 2,385,000
2	Interest	3,928,541	-2%	3,841,676	-3%	3,736,426	-3%	3,625,676	-3%	3,509,301
2008 Series A/CREBs										
3	Principal	566,667	3%	581,667	3%	601,667	2%	616,667	3%	636,667
4	Interest	844,408	-2%	826,692	-2%	808,275	-2%	789,158	-3%	769,342
2012 Series B										
5	Principal	180,000	6%	190,000	3%	195,000	3%	200,000	3%	205,000
6	Interest	346,719	-1%	343,019	-1%	339,169	-1%	334,219	-2%	328,144
Estimated Future Series										
7	Principal	-	0%	-	0%	-	0%	226,000	5%	237,000
8	Interest	-	0%	-	0%	750,000	0%	750,000	-1%	739,000
Total Revenue Bonds										
9	Principal	2,711,667	4%	2,821,667	5%	2,956,667	12%	3,312,667	5%	3,463,667
10	Interest	5,119,668	-2%	5,011,387	12%	5,633,870	-2%	5,499,053	-3%	5,345,787
11	Total Debt Service - Revenue Bonds	\$ 7,831,335	0%	\$ 7,833,053	10%	\$ 8,590,537	3%	\$ 8,811,720	0%	\$ 8,809,453
Clean Water Fund Notes										
CSO Projects										
12	Principal	1,936,525	-2%	1,906,421	-3%	1,856,285	-12%	1,625,238	-2%	1,594,603
13	Interest	411,493	-9%	373,209	-10%	334,878	-10%	300,523	-11%	268,246
Non-CSO Projects										
14	Principal	348,279	2%	355,309	-6%	337,652	-39%	207,028	1%	208,774
15	Interest	71,585	-10%	64,555	-11%	57,404	-9%	52,030	-8%	47,894
Estimated Future Notes - CSO Projects										
16	Principal	585,092	-40%	351,031	123%	783,892	-25%	590,280	2%	602,194
17	Interest	78,799	93%	152,372	45%	220,235	6%	234,088	-5%	222,174
Estimated Future Notes - Non-CSO Projects										
18	Principal	319,697	-43%	181,197	2%	184,855	1572%	3,090,536	1%	3,124,503
19	Interest	63,321	22%	77,089	-5%	73,432	402%	368,406	154%	935,751
Total Clean Water Fund Notes										
20	Principal	3,189,593	-12%	2,793,958	13%	3,162,684	74%	5,513,082	0%	5,530,074
21	Interest	625,198	7%	667,225	3%	685,948	39%	955,048	54%	1,474,064
22	Total Debt Service - CWF Notes	\$ 3,814,791	-9%	\$ 3,461,183	11%	\$ 3,848,632	68%	\$ 6,468,130	8%	\$ 7,004,138
City of New Haven Share of CSO Projects										
CSO Projects										
23	Principal	(774,610)	-2%	(762,568)	-3%	(742,514)	-12%	(650,095)	-2%	(637,841)
24	Interest	(164,597)	-9%	(149,284)	-10%	(133,951)	-10%	(120,209)	-11%	(107,298)
Estimated Future Notes - CSO Projects										
25	Principal	(234,037)	-40%	(140,412)	123%	(313,557)	-25%	(236,112)	2%	(240,878)
26	Interest	(31,520)	93%	(60,949)	45%	(88,094)	6%	(93,635)	-5%	(88,870)
Total City Share of CSO Projects										
27	Principal	(1,008,647)	-10%	(902,981)	17%	(1,056,071)	-16%	(886,207)	-1%	(878,719)
28	Interest	(196,117)	7%	(210,232)	6%	(222,045)	-4%	(213,845)	-8%	(196,168)
29	Total Debt Service - New Haven Share	\$ (1,204,763)	-8%	\$ (1,113,213)	15%	\$ (1,278,116)	-14%	\$ (1,100,052)	-2%	\$ (1,074,887)
Total Net Debt Service										
30	Principal	4,892,613	-4%	4,712,644	7%	5,063,279	57%	7,939,542	2%	8,115,022
31	Interest	5,548,750	-1%	5,468,379	12%	6,097,773	2%	6,240,257	6%	6,623,683
32	Total Net Debt Service	\$ 10,441,363	-2%	\$ 10,181,023	10%	\$ 11,161,052	27%	\$ 14,179,798	4%	\$ 14,738,705

Exhibit 4
Capital Improvement Plan
For the fiscal years ended June 30, 2014 through 2018

Line No.	Description	1 FY14	3 FY15	5 FY16	7 FY17	8 FY18	9 Total
CSO LONG TERM CONTROL PLAN							
1	Wet Weather/Nitrogen Improvements - Construction (441)	\$ 14,000,000	-	-	-	-	\$ 14,000,000
2	Wet Weather Improvements to the ESWPCF - (Phase II)	-	-	\$ 50,000,000	-	-	50,000,000
3	CSO Sewer Separation - Various Locations	-	-	17,000,000	-	-	17,000,000
4	Total CSO Long Term Control Plan	\$ 14,000,000	\$ -	\$ 67,000,000	\$ -	\$ -	\$ 81,000,000
EAST SHORE WPC FACILITY							
5	Major Equipment Upgrades & Replacement	-	-	\$ 2,000,000	-	-	\$ 2,000,000
6	Total East Shore WPC Facility	\$ -	\$ -	\$ 2,000,000	\$ -	\$ -	\$ 2,000,000
COLLECTION SYSTEM, PUMP STATIONS & FORCE MAINS							
7	Collection System I/I Rehab. Program Section 3c	\$ 5,000,000	-	\$ 5,000,000	-	\$ 5,000,000	\$ 15,000,000
8	Sanitary Sewer Infrastructure Renewal Program	500,000	\$ 1,200,000	4,700,000	\$ 1,200,000	1,200,000	8,800,000
9	Pump Station Improvements	-	-	3,500,000	-	-	3,500,000
10	Emergency Sanitary Sewer Repair or Replacement	-	-	6,000,000	-	-	6,000,000
11	TV Truck	150,000	-	-	-	-	150,000
12	Arch Street Pump Station	50,000	-	-	-	-	50,000
13	Primary Basin Scum	170,000	-	-	-	-	170,000
14	Manhole Rehab	150,000	-	-	-	-	150,000
15	Planning Grant - Paradise	100,000	-	-	-	-	100,000
16	East Shore Plant Upgrades	80,000	-	-	-	-	80,000
17	Total Coll. System, Pump Stations & Force Mains	\$ 6,200,000	\$ 1,200,000	\$ 19,200,000	\$ 1,200,000	\$ 6,200,000	\$ 34,000,000
18	TOTAL CAPITAL IMPROVEMENT PLAN	\$ 20,200,000	\$ 1,200,000	\$ 88,200,000	\$ 1,200,000	\$ 6,200,000	\$ 117,000,000
SOURCES OF FINANCING							
19	Clean Water Fund - Grants	\$ 3,500,000	-	\$ 21,000,000	-	-	\$ 24,500,000
20	Clean Water Fund - Notes	15,500,000	-	51,000,000	-	\$ 5,000,000	71,500,000
21	Total Clean Water Fund	19,000,000	-	72,000,000	-	5,000,000	96,000,000
22	Revenue Bonds	-	-	15,000,000	-	-	15,000,000
23	Dedicated Infrastructure Renewal Fund	1,200,000	\$ 1,200,000	1,200,000	\$ 1,200,000	1,200,000	6,000,000
24	Total Sources of Financing	\$ 20,200,000	\$ 1,200,000	\$ 88,200,000	\$ 1,200,000	\$ 6,200,000	\$ 117,000,000

Exhibit 5 Organization Chart

